

## CLAIMS

- 1 1. A method for managing a time-limited long-running process carried out upon an  
2 array of disks comprising the steps of:  
3 establishing a registry of entry with respect to each of a plurality of groups of  
4 disks of the array of disks having a value indicative of a respective time at which each of  
5 the group was last acted-upon by the long-running process; and  
6 performing the long-running process on each of the groups based upon an order in  
7 which the groups having an oldest last acted-upon time are processed first and the groups  
8 having the newest last acted-upon time are processed last.
- 1 2. The method as set forth in claim 1 further comprising updating a value of the last  
2 acted-upon time for each of the groups as each of the groups is respectively completely  
3 processed by the long running process.
- 1 3. The method as set forth in claim 2 further comprising ceasing the long-running  
2 process based upon a time limit from an initiation time of the long-running process.
- 1 4. The method as set forth in claim 3 wherein the step of ceasing the long-running  
2 process includes ceasing the step of updating so that the groups not completely processed  
3 by the long-running process retain a previous value for their respective last acted-upon  
4 time.
- 1 5. The method as set forth in claim 4 wherein the step of establishing the registry  
2 entry includes providing a value for a last position in each of the groups at which the  
3 long-running process was performed and wherein the step of ceasing the long-running  
4 process includes providing, in each of the groups for which the long-running process was  
5 not completed, the respective last position value.
- 1 6. The method as set forth in claim 5 wherein the groups each comprise groups of  
2 disks based upon a redundant array of independent disk (RAID) organization and the last

3 position value is based upon a predetermined data stripe within each of the respective  
4 groups of RAID-organized disks.

1 7. The method as set forth in claim 6 wherein the long-running process comprises a  
2 RAID scrubbing process.

1 8. The method as set forth in claim 6 wherein the registry comprises a set of key  
2 values including a volume-related file system identifier and a RAID group identifier with  
3 respect to RAID groups within the volume.

1 9. The method as set forth in claim 8 wherein the registry is located in a file that is  
2 read from at least one storage location on the array of disks.

1 10. The method as set forth in claim 6 further comprising sorting each entry in the  
2 registry based upon the last acted-upon time value and establishing a process queue, the  
3 order of which is the order in which the long-running process is performed on respective  
4 of the groups.

1 11. The method as set forth in claim 5 further comprising setting a value of the last  
2 acted-upon time for each of the groups that is newly added to the registry to the oldest  
3 last acted-upon time.

1 12. The method as set forth in claim 11 wherein the last position value for each of the  
2 newly added groups and the last position value for each of the groups completely proc-  
3 essed is a beginning group data location value.

1 13. The method as set forth in claim 10 further comprising defining a plurality of  
2 working threads, each performing the long-running process, each of the threads per-  
3 forming the process to a top entry in the process queue as each thread is ready to take on  
4 one of the groups for processing thereon.

1 14. A system for managing a time-limited long-running process carried out upon an  
2 array of disks comprising:

3 a registry that stores an entry with respect to each of a plurality of groups of disks  
4 of the array of disks having a value indicative of a respective time at which each of the  
5 group was last acted-upon by the long-running process; and

6 a sorting long-running process on each of the groups based upon an order in  
7 which the groups having an oldest last acted-upon time are processed first and the groups  
8 having the newest last acted-upon time are processed last.

1 15. The system as set forth in claim 14 further comprising means for updating a value  
2 of the last acted-upon time for each of the groups as each of the groups is respectively  
3 completely processed by the long running process.

1 16. The system as set forth in claim 15 further comprising a timer that ceases the  
2 long-running process based upon a time limit from an initiation time of the long-running  
3 process.

1 17. The system as set forth in claim 16 wherein the timer is adapted to cease the  
2 means for updating so that the groups not completely processed by the long-running pro-  
3 cess retain a previous value for their respective last acted-upon time.

1 18. The system as set forth in claim 17 wherein each registry entry includes a value  
2 for a last position in each of the groups at which the long-running process was performed  
3 and wherein each entry further includes a last position value for each of the groups for  
4 which the long-running process was not completed.

1 19. The system as set forth in claim 18 wherein the groups each comprise groups of  
2 disks based upon a redundant array of independent disk (RAID) organization and the last  
3 position value is based upon a predetermined data stripe within each of the respective  
4 groups of RAID-organized disks.

1 20. The system as set forth in claim 19 wherein the long-running process comprises a  
2 RAID scrubbing process.

1 21. The system as set forth in claim 19 wherein the registry comprises a file including  
2 a set of key values including a volume-related file system identifier and a RAID group  
3 identifier with respect to RAID groups within the volume.

1 22. The system as set forth in claim 21 wherein the file system identifier and the  
2 RAID group identifier correspond with a disk label file system identifier and a disk label  
3 RAID group identifier located in a predetermined storage location on one or more of the  
4 disks in the array of disks.

1 23. The system as set forth in claim 22 wherein a value of the last acted-upon time for  
2 each of the groups that is newly added to the registry is set to the oldest last acted-upon  
3 time.

1 24. The system as set forth in claim 23 wherein the last position value for each of the  
2 newly added groups and the last position value for each of the groups completely proc-  
3 essed is a beginning group data location value.

1 25. The system as set forth in claim 24 further comprising a plurality of working  
2 threads, each performing the long-running process, each of the threads performing the  
3 process to a top entry in the process queue as each thread is ready to take on one of the  
4 groups for processing thereon.

1 26. A computer-readable medium including program instructions executing on a  
2 computer for managing a time-limited long-running process carried out upon an array of  
3 disks, the program instructions performing the steps of:  
4 establishing a registry of entry with respect to each of a plurality of groups of  
5 disks of the array of disks having a value indicative of a respective time at which each of  
6 the group was last acted-upon by the long-running process; and



3 a file system identifier indicating a volume of the disk array and a group identifier  
4 indicating a discrete storage organizational group of the volume, each of the file system  
5 identifier and the group identifier corresponding with identifiers stored within one or  
6 more disks of the array of disks; and

7 a last acted-upon time value representative of a time at which the long running  
8 process was last performed on the group, the last acted-upon time adapted to be updated  
9 to a current timestamp when the long-running process is completed on the group and to  
10 be read so as to form a queue by which each group is processed by the long-running pro-  
11 cess, with an oldest last acted-upon time value being processed first and a newest being  
12 processed last.

1 33. The data structure as set forth in claim 32 further comprising a last data position  
2 value that indicates a last data position within a group that has been processed by the  
3 long-running process adapted so that the long-running process begins processing at the  
4 last data position in the group.

1 34. The data structure as set forth in claim 33 wherein the last data position is set to a  
2 beginning data position if the group is newly added or completely processed in a previous  
3 run of the long-running process.

1 35. The data structure as set forth in claim 32 wherein each group comprises a group  
2 organized as a redundant array of independent disks (RAID) the group identifier com-  
3 prises a RAID group identifier.